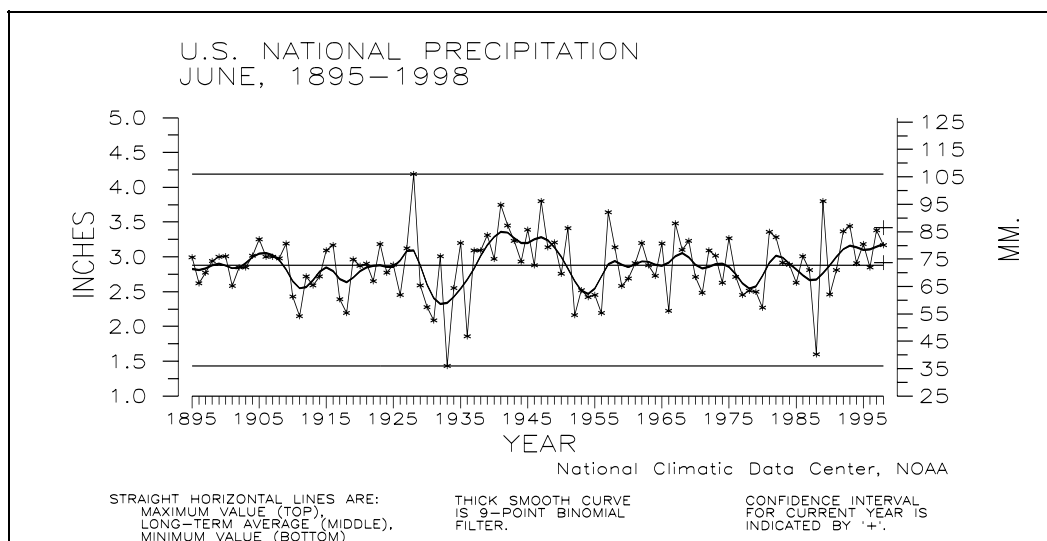
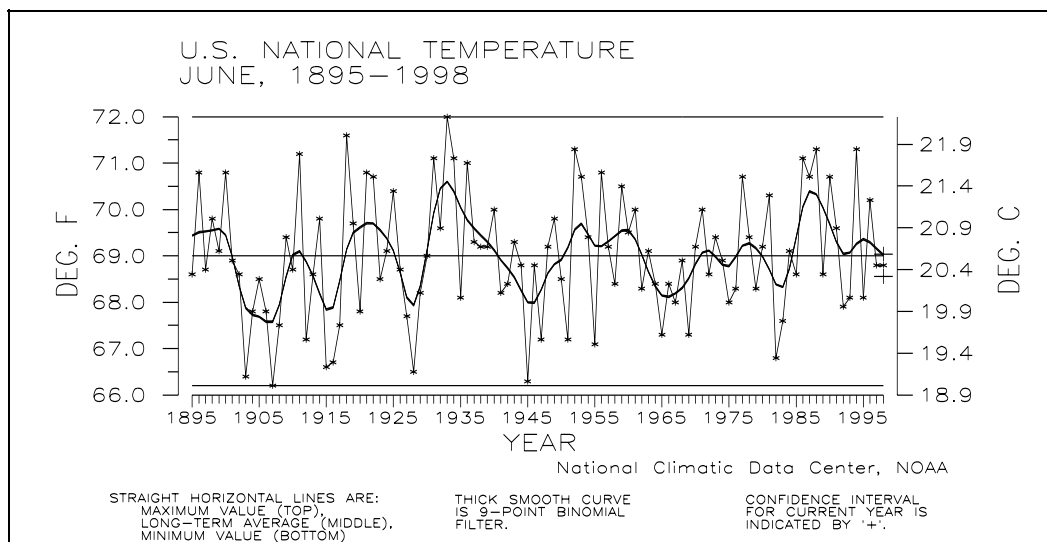


CLIMATE VARIATIONS BULLETIN



This CLIMATE VARIATIONS BULLETIN (CVB) is a preliminary report that puts current monthly climate anomalies into historical perspective using climate databases archived at the National Climatic Data Center (NCDC). It is issued on a monthly basis. Supplemental sections are included which address seasonal and annual perspectives, when appropriate.

Current data are based on preliminary reports from River Forecast Center stations and First and Second Order airport stations obtained from the National Weather Service (NWS) Climate Prediction Center. **THE CURRENT DATA SHOULD BE USED WITH CAUTION.** These preliminary data are useful for estimating how current anomalies compare to the historical record, however the actual values and rankings for the current year will change as the final data arrive at NCDC and are processed.

The following NCDC datasets are used for the historical data: the climate division drought database (TD-9640), and the hurricane datasets (TD-9636 and TD-9697). It should be noted that the climate division drought database consists of monthly data for 344 climate divisions in the contiguous United States. These divisional values are calculated from the 6000+ station Cooperative Observer network.

If you are a climate researcher and would like to order copies of the historical datasets used to make graphs of the type in this report, call 828-271-4994 or fax a letter to 828-271-4876 or mail a letter to the address given below, ATTN: Research User Services.

All other questions or requests for data should be made by calling 828-271-4800 or sending a fax to 828-271-4876 or by writing to:

National Climatic Data Center, NOAA
Federal Building
151 Patton Avenue, Room 120
Asheville, NC 28801-5001

If you use any of the information from this CVB, please identify "National Climatic Data Center, NOAA" as the source.

UNITED STATES JUNE CLIMATE IN HISTORICAL PERSPECTIVE

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TABLE 1. PRECIPITATION AND TEMPERATURE RANKS, BASED
ON THE PERIOD 1895-1998. 1 = DRIEST/COLDEST,
104 = WETTEST/WARMEST FOR JUNE 1998,
104 = WETTEST/WARMEST FOR MAY-JUNE 1998,
104 = WETTEST/WARMEST FOR JAN-JUNE 1998,
103 = WETTEST/WARMEST FOR JULY 1997-JUNE 1998.

REGION	JUN 1998	MAY-JUN 1998	JAN-JUN 1998	JUL 1997- JUN 1998
-----	----	-----	-----	-----
PRECIPITATION:				
NORTHEAST	100	101	103	95
EAST NORTH CENTRAL	93	89	100	79
CENTRAL	103	84	89	62
SOUTHEAST	11	9	98	100
WEST NORTH CENTRAL	95	79	80	91
SOUTH	12	1	29	40
SOUTHWEST	59	20	58	85
NORTHWEST	58	101	94	86
WEST	97	104	104	102
NATIONAL	77	42	101	97
TEMPERATURE:				
NORTHEAST	39	92	104	96
EAST NORTH CENTRAL	33	91	103	100
CENTRAL	60	91	103	86
SOUTHEAST	98	99	82	61
WEST NORTH CENTRAL	11	54	89	94
SOUTH	97	104	95	78
SOUTHWEST	27	43	57	65
NORTHWEST	48	44	90	95
WEST	14	4	33	51
NATIONAL	48	86	97	94

TABLE 2. EXTREMES, 1961-90 NORMALS, AND 1998 VALUES FOR JUNE. IT SHOULD BE NOTED THAT THE 1998 VALUES WILL CHANGE WHEN THE FINAL DATA ARE PROCESSED.

REGION	PRECIPITATION (INCHES)				NORMAL PCPN	1998 PCPN
	DRIEST VALUE	YEAR	WETTEST VALUE	YEAR		
NORTHEAST	1.60	1988	8.53	1972	3.84	6.08
EAST NORTH CENTRAL	1.41	1910	6.68	1967	3.89	5.52
CENTRAL	1.03	1988	9.10	1928	3.95	6.55
SOUTHEAST	2.20	1931	8.37	1900	4.86	3.28
WEST NORTH CENTRAL	1.25	1933	5.27	1947	2.73	3.97
SOUTH	.98	1933	6.85	1989	3.66	2.10
SOUTHWEST	.16	1916	1.93	1927	.93	.87
NORTHWEST	.32	1919	3.02	1947	1.48	1.51
WEST	.01	1935	1.14	1963	.46	.99
NATIONAL	1.43	1933	4.19	1928	2.84	3.17*

* PRELIMINARY VALUE, CONFIDENCE
INTERVAL + OR - .25 INCHES

REGION	TEMPERATURE (DEGREES F)				NORMAL TEMP	1998 TEMP
	COLDEST VALUE	YEAR	WARMEST VALUE	YEAR		
NORTHEAST	60.3	1958	68.6	1943	64.4	64.2
EAST NORTH CENTRAL	59.5	1969	72.4	1933	65.3	64.3
CENTRAL	66.2	1903	77.6	1952	71.3	72.1
SOUTHEAST	73.0	1955	80.8	1952	75.8	79.1
WEST NORTH CENTRAL	56.7	1951	71.6	1988	63.2	59.4
SOUTH	72.1	1903	83.8	1953	77.6	81.1
SOUTHWEST	63.4	1907	72.8	1994	68.1	66.5
NORTHWEST	54.9	1953	64.8	1918	59.9	58.7
WEST	62.2	1944	74.0	1918	67.7	64.7
NATIONAL	66.2	1907	72.0	1933	69.0	68.8*

* PRELIMINARY VALUE, CONFIDENCE
INTERVAL + OR - .2 DEG. F.

TABLE 3.

STATISTICS FOR SELECTED RIVER BASINS: PRECIPITATION RANKING FOR OCT-JUN 1997-98, WHERE RANK OF 1 = DRIEST, 103 = WETTEST, BASED ON THE PERIOD 1895 TO 1998, AREAL PERCENT OF THE BASIN EXPERIENCING SEVERE OR EXTREME LONG-TERM (PALMER) DROUGHT, AND AREAL PERCENT OF THE BASIN EXPERIENCING SEVERE OR EXTREME LONG-TERM (PALMER) WET CONDITIONS, AS OF JUNE 1998.
RIVER BASIN REGIONS AS DEFINED BY THE U.S. WATER RESOURCES COUNCIL.

RIVER BASIN -----	PRECIPITATION RANK -----	% AREA DRY -----	% AREA WET -----
MISSOURI BASIN	77	.0%	30.0%
PACIFIC NORTHWEST BASIN	71	.0%	27.6%
CALIFORNIA RIVER BASIN	102	.0%	100.0%
GREAT BASIN	98	.0%	86.9%
UPPER COLORADO BASIN	53	.0%	51.4%
LOWER COLORADO BASIN	79	.0%	37.6%
RIO GRANDE BASIN	33	.0%	.0%
ARKANSAS-WHITE-RED BASIN	57	.0%	6.3%
TEXAS GULF COAST BASIN	49	.0%	.0%
SOURIS-RED-RAINY BASIN	91	.0%	47.4%
UPPER MISSISSIPPI BASIN	94	.0%	12.3%
LOWER MISSISSIPPI BASIN	50	.0%	.0%
GREAT LAKES BASIN	39	6.7%	.0%
OHIO RIVER BASIN	57	.0%	.0%
TENNESSEE RIVER BASIN	77	.0%	48.1%
NEW ENGLAND BASIN	94	.0%	30.2%
MID-ATLANTIC BASIN	98	.0%	37.3%
SOUTH ATLANTIC-GULF BASIN	99	.0%	8.8%

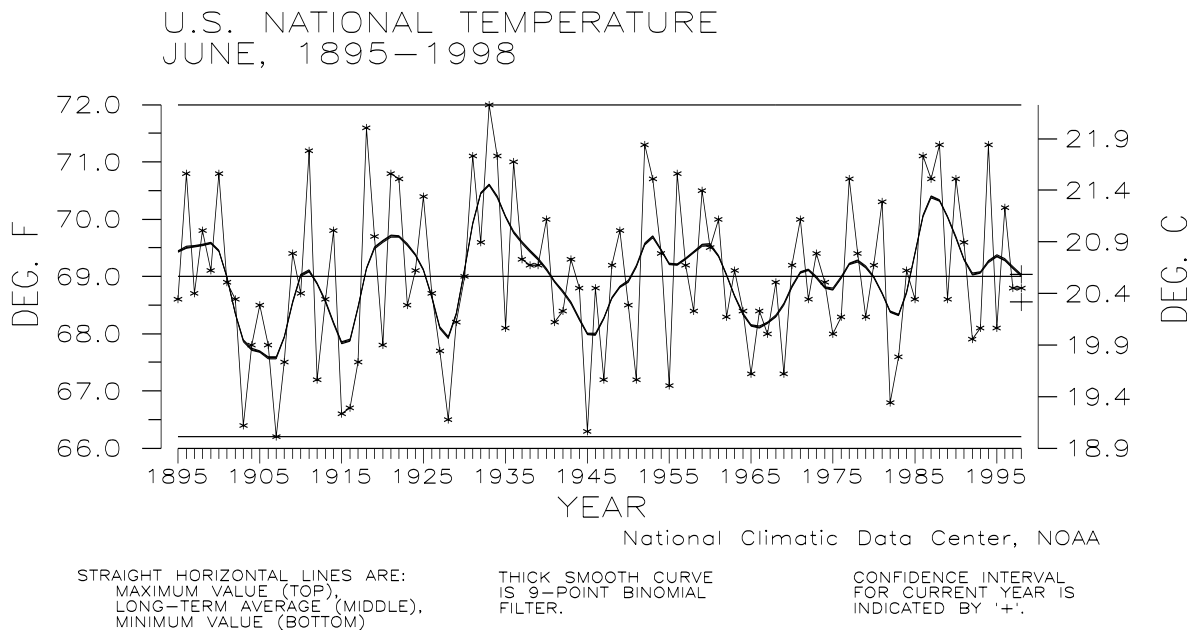


Figure 1: Preliminary data for June 1998 indicate that temperature averaged across the contiguous United States was near the long-term mean ranking as the 48th coolest June since 1895. Eleven percent of the country was much cooler than normal while twenty percent of the country was much warmer than normal.

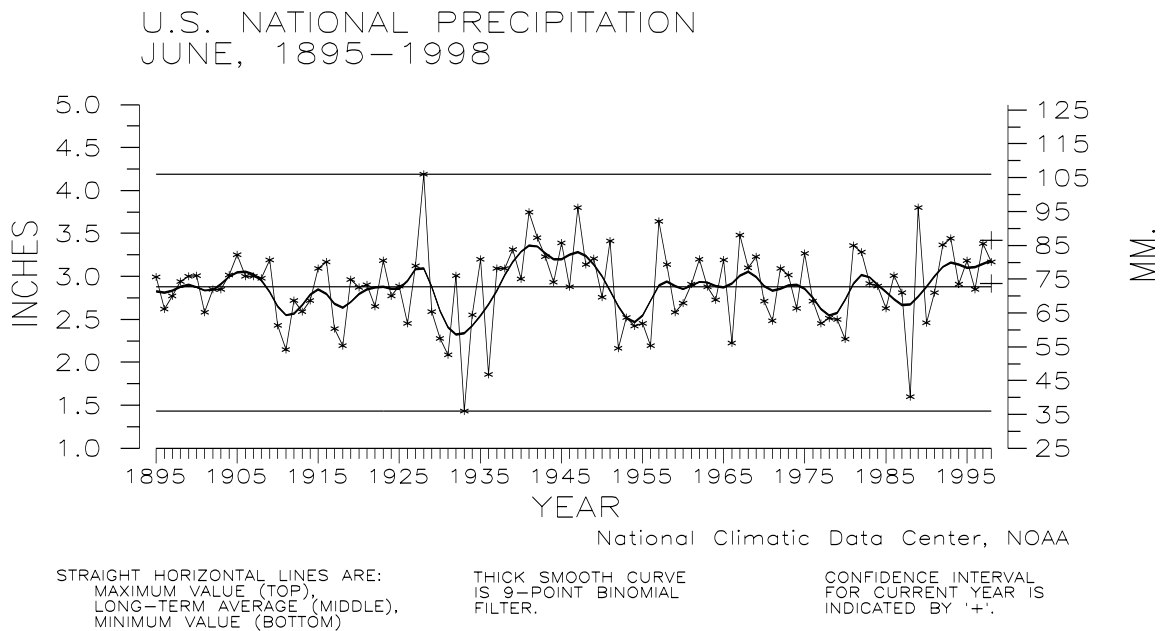


Figure 2: June 1998 was the 28th wettest such month since 1895. Over 22% of the country experienced much wetter than normal conditions while about nine percent of the country was much drier than normal.

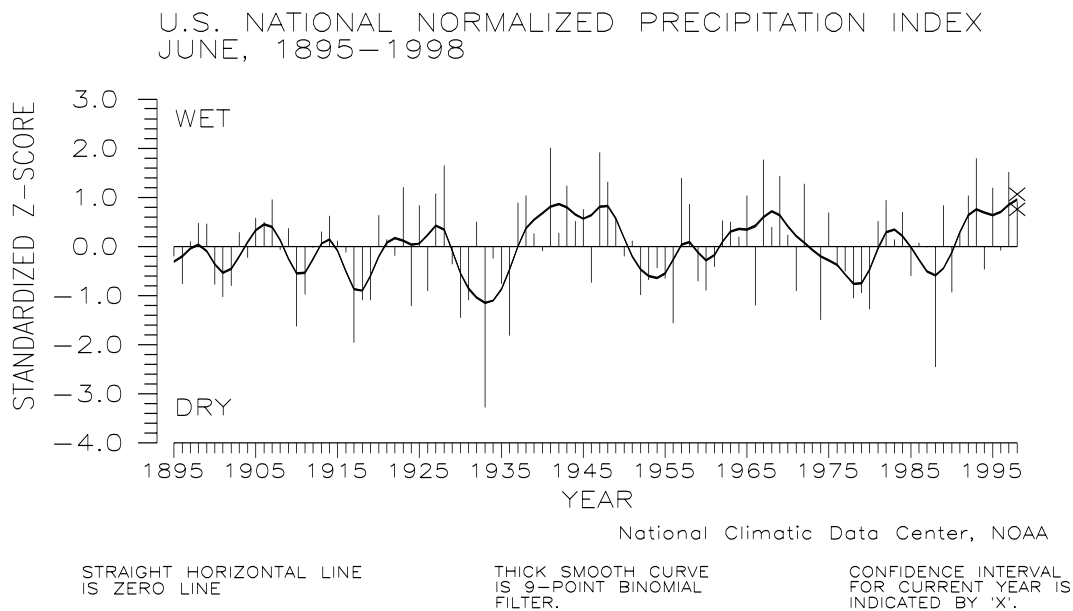


Figure 3: The preliminary national standardized precipitation index ranked June 1998 as the 20th wettest such month on record. This standardized z-score is estimated to be accurate to within 0.149 index units and its confidence interval is shown as an 'X'.

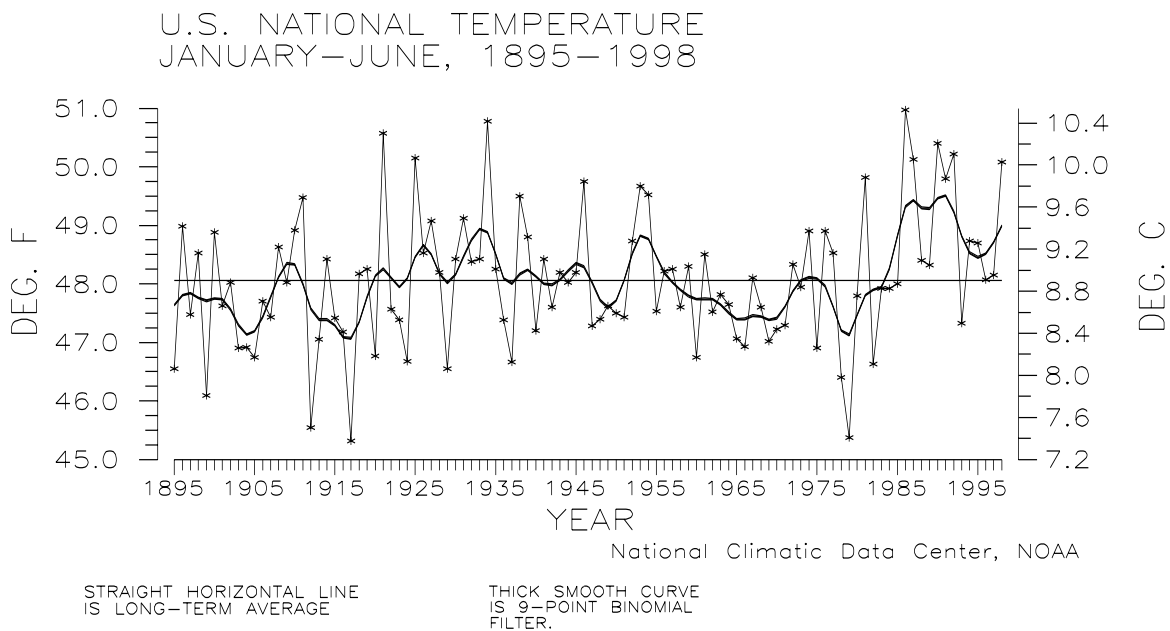


Figure 4: Based upon preliminary data, January-June 1998 was the 8th warmest such period on record. Over 46% percent of the country had much warmer than normal January-June temperatures while none of the country was much cooler than normal. Twelve of the last thirteen such six-month periods have been above- to much-above the long-term mean.

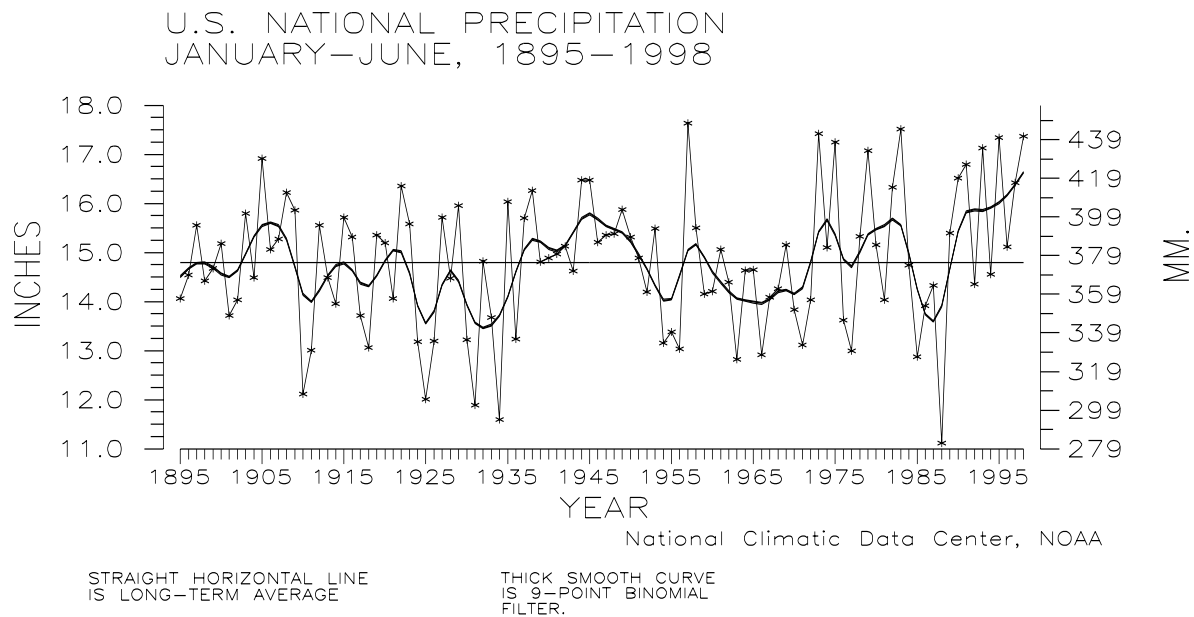


Figure 5: Preliminary precipitation data indicate that the year-to-date, January-June 1998, was the fourth wettest such six-month period since records began. About 31% of the country was much wetter than normal while about four percent of the country was much drier than normal. Eight of the last ten such six-month periods have had precipitation above-to much-above the long-term mean.

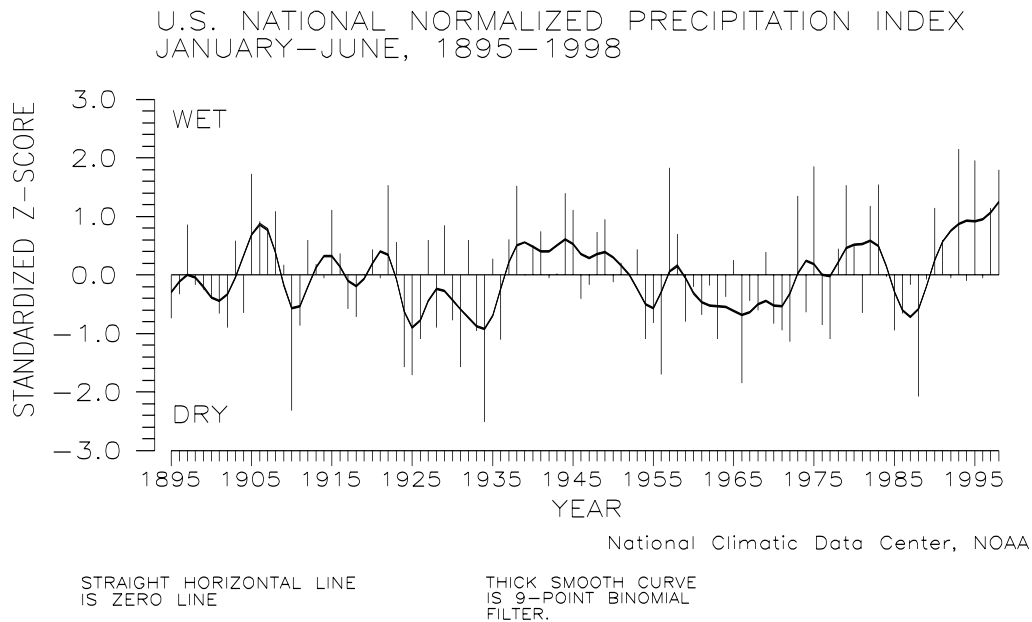
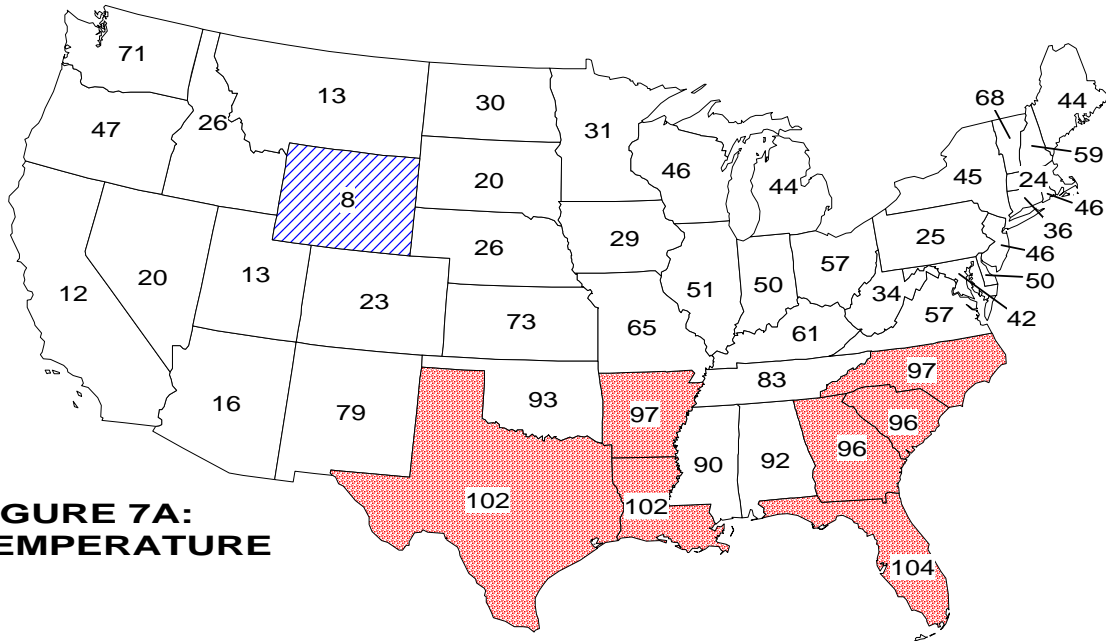
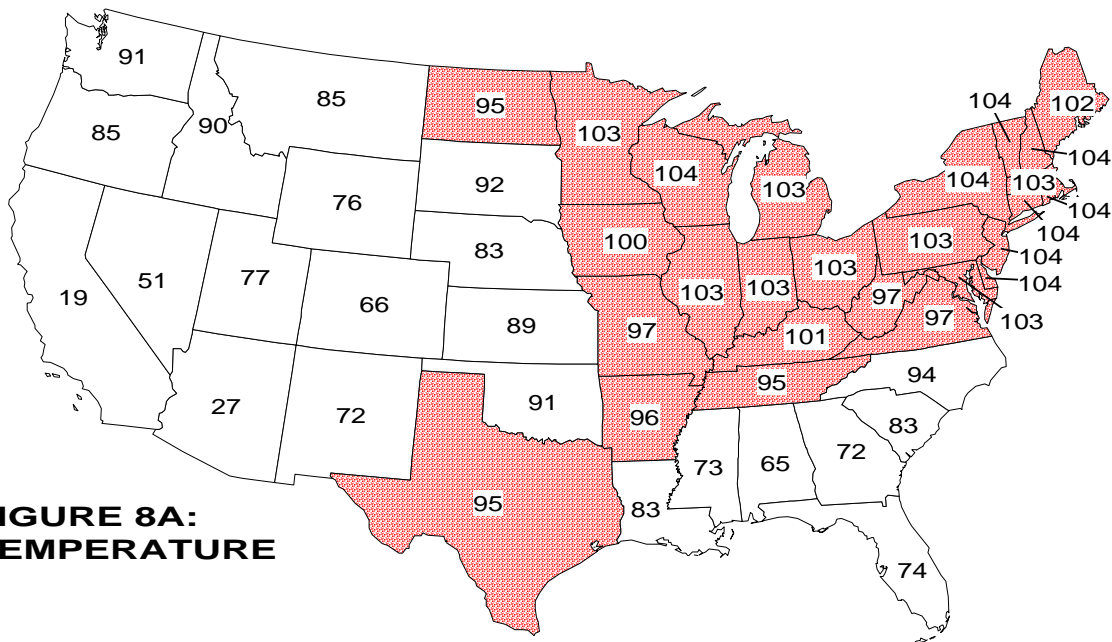


Figure 6: The preliminary national year-to-date standardized precipitation index ranked January-June 1998 as the 5th wettest such period since 1895.

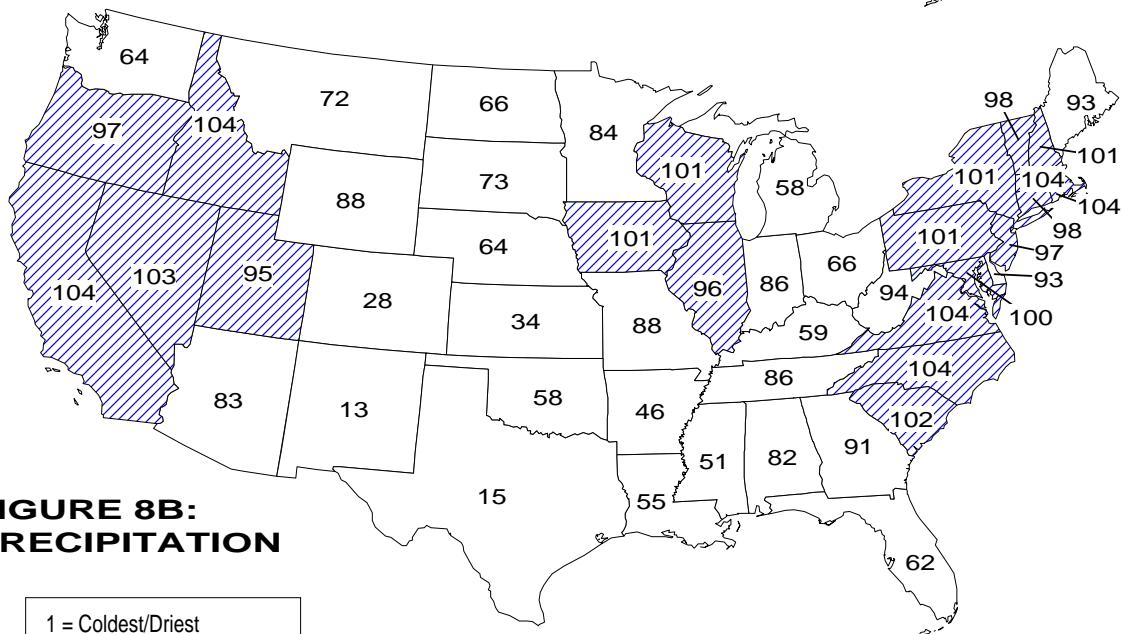
JUNE 1998 STATEWIDE RANKS



JAN-JUNE 1998 STATEWIDE RANKS



**FIGURE 8A:
TEMPERATURE**



**FIGURE 8B:
PRECIPITATION**

1 = Coldest/Driest
104 = Warmest/Wettest

National Climatic Data Center, NOAA

Temperature and Precipitation Ranks for the contiguous United States. Each state is ranked based on its data from 1895-1998. States having a rank of top ten coldest or driest (rank 1-10) or top ten warmest or wettest (rank 95-104) are shaded.

SSMI MEAN TEMP. ANOMALY IN CELSIUS JUNE 1998
(SNOW COVER WITHIN OR NORTH OF 15% CONTOUR)

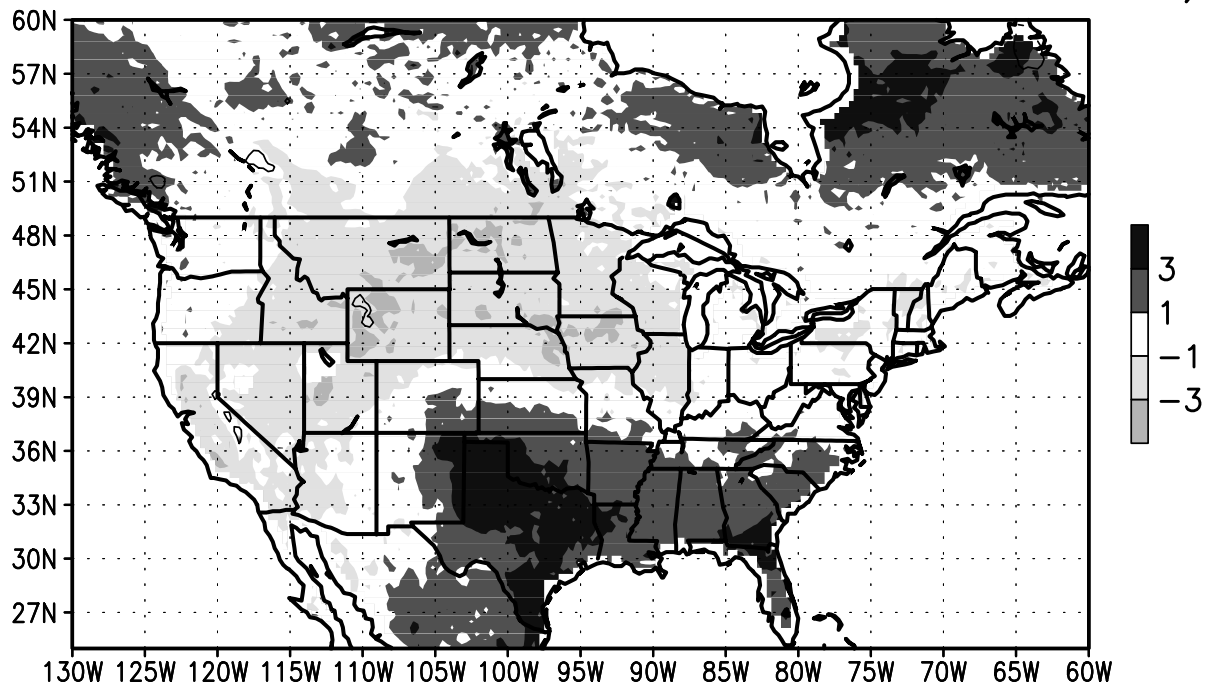


Figure 9

SURFACE WETNESS ANOMALY (%) JUNE 1998

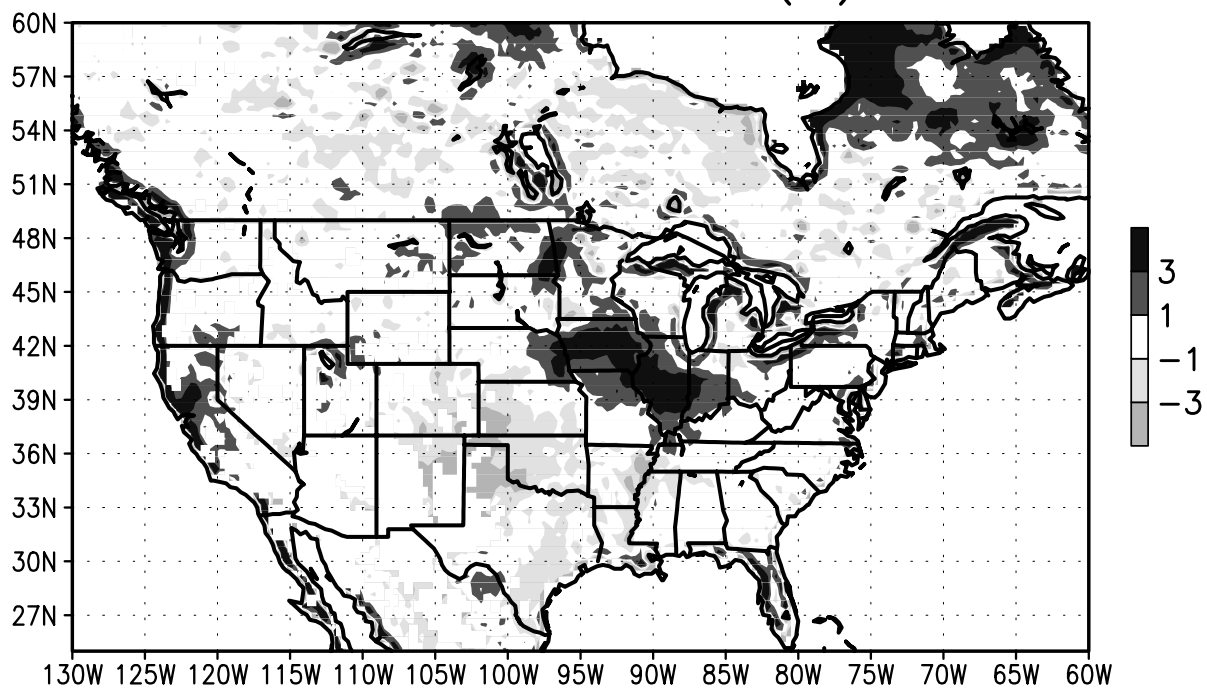


Figure 10

Figure 7A shows, in illustrative map form, the June 1998 temperature rankings for the 48 contiguous states. Seven states, all located in the Southeast and South, were within the top ten warm portion of the historical distribution while an additional seven states ranked within the warm third of the historical distribution. Only one state ranked within the top ten cool portion of the historical distribution while fifteen others ranked within the cool third of the distribution.

June 1998 state ranks for precipitation are shown in **Figure 7B**. Sixteen states ranked within the top ten wet portion of the distribution while ten others ranked within the wet third portion of the distribution. Two states also ranked within the top ten dry portion of the historical distribution while ten others ranked within the dry third. ***It should be noted that these June state categorical precipitation ranks are preliminary and should be used with considerable caution due to the high variability of precipitation on a small space and time scale.***

Year-to-date statewide temperature and precipitation ranks are shown in **Figures 8A and 8B**. Twenty-six states ranked within the top ten warm portion of the historical distribution including the warmest such six-month period on record for Connecticut, Delaware, New Hampshire, New Jersey, New York, Rhode Island, Vermont, and Wisconsin. Seventeen other states ranked within the warm third of the distribution. No state was within the top ten cool and only two ranked within the cool third of the distribution (AZ and CA). Twenty states had their tenth wettest or wetter January-June period including the wettest such period on record for California, Idaho, Massachusetts, North Carolina, Rhode Island, and Virginia. Thirteen others ranked within the wet third portion of the distribution. No state was within the top ten dry portion of the distribution for the six-month period while only four (CO, KS, NM, & TX) ranked within the dry third of the historical distribution for the January-June period.

It should be emphasized that all of the temperature and precipitation ranks on these maps and in Table 1 are based on preliminary data. The ranks will change when the final data are processed.

Figure 9 shows mean monthly temperature anomalies for the month of June 1998. The base period is seven years (1992-1998). This experimental product is derived from the Special Sensor Microwave Imager (SSM/I), an instrument flown on a polar orbiting satellite of the defense meteorological satellite program. The anomalies are in degrees Celsius. Above normal temperatures covered the southern plains and southeastern states, where sub-tropical high pressure brought stable air, clear skies and below normal rainfall to the area. In contrast, below normal temperatures, persistent cloud cover and above normal rainfall extended from California to the northern Great Plains, Midwest, and northeastern states during much of the month. The only region of the country with near normal temperatures was the northwestern states. South-central Canada also had below normal temperatures, whereas the northern tier of Canada was warmer than normal during June.

Figure 10 shows the mean monthly surface wetness anomalies for June 1998. This product is derived from the SSM/I. Values represent the deviation from the climatological average, using a 1992-1998 base period. Surface wetness can originate from numerous sources: rainfall, melting snow cover, river flood plain, wetlands, or irrigated fields. The radiating surface observed by the satellite can be the ground, or in places of dense vegetation, it can be the water in the vegetated canopy itself. These wetness values do not necessarily equate to soil moisture, although in areas of sparse or limited vegetation, there is a strong correspondence. During June, the northern plains and midwest had an extremely wet surface, associated with frequent rainfall. Below normal wetness in the southern plains is associated with dry weather during the month. The extreme dry conditions over the southeastern U.S., and extremely wet conditions over the northeastern U.S. are not evident in this image since the dense vegetated canopy obscures the abnormal conditions on the ground. Central Canada had normal wetness for the month, whereas the eastern Provinces were wetter than normal for June. The full and anomalous surface wetness fields as well as the temperature and snow cover anomalies for North America and the globe can be seen in greater detail at <http://www.ncdc.noaa.gov/plwebapps/plsql/ssmimain>.

U.S. PERCENT AREA DRY AND WET JANUARY 1994 THROUGH JUNE 1998

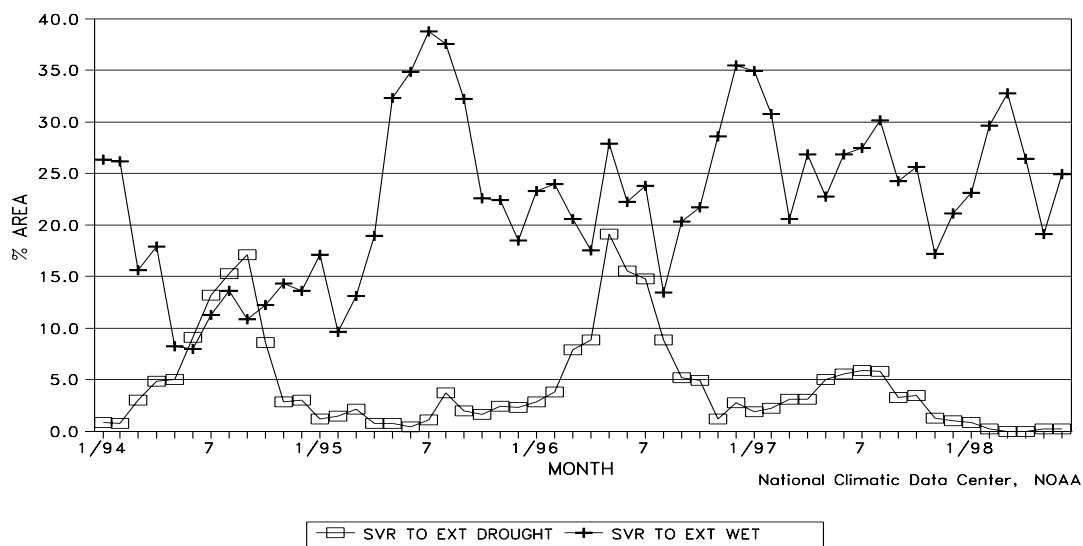


Figure 11: Long-term drought coverage (as measured by the Palmer Drought Index) remained relatively low with June 1998 having less than one percent of the country in severe to extreme drought. The percent area of the country experiencing severe to extreme wetness climbed slightly to nearly 25%. The core dry areas included upper-Michigan and central Florida while core wet areas included California, the Great Basin, southern Arizona, the central Rockies, the northern Great Plains, and portions of the mid-Atlantic and New England.

PRIMARY CORN AND SOYBEAN BELT PRECIPITATION MARCH–JUNE, 1895–1998

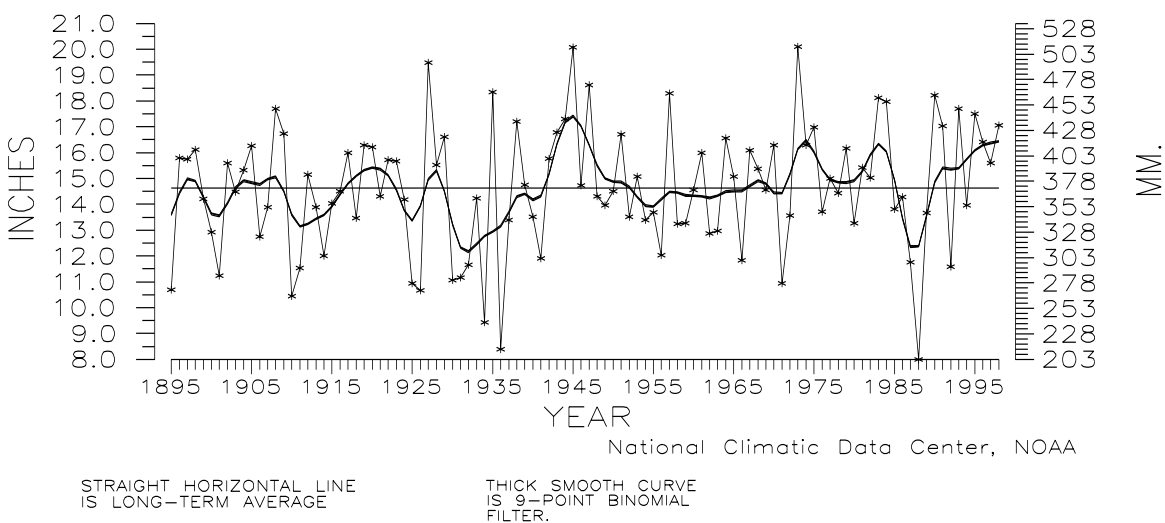


Figure 12: Preliminary data indicate that precipitation averaged across the Primary Corn and Soybean agricultural belt was above the long-term mean for the growing-season-to-date.

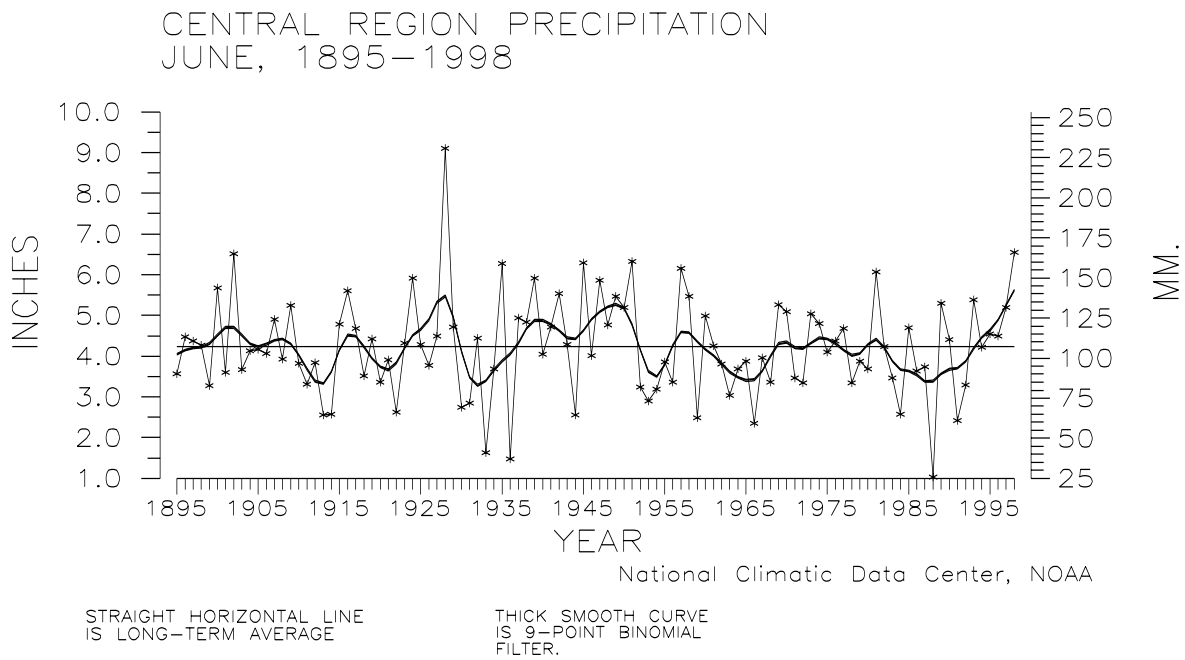


Figure 13: Preliminary data ranked June 1998 as the second wettest such month on record for the Central Region. The Central Region includes Illinois, Indiana, Kentucky, Missouri, Ohio, West Virginia, and Tennessee.

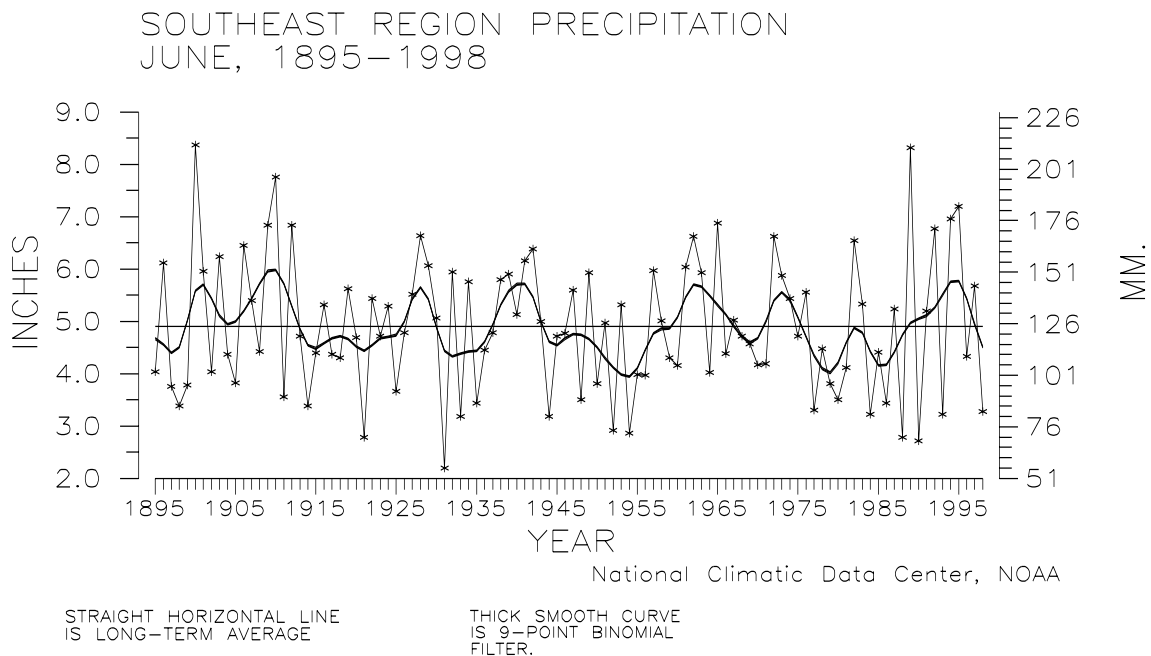


Figure 14: Preliminary data ranked June 1998 as the eleventh driest such month on record for the Southeast Region. The Southeast Region includes Alabama, Florida, Georgia, North Carolina, South Carolina, and Virginia.

SOUTH REGION TEMPERATURE JUNE, 1895–1998

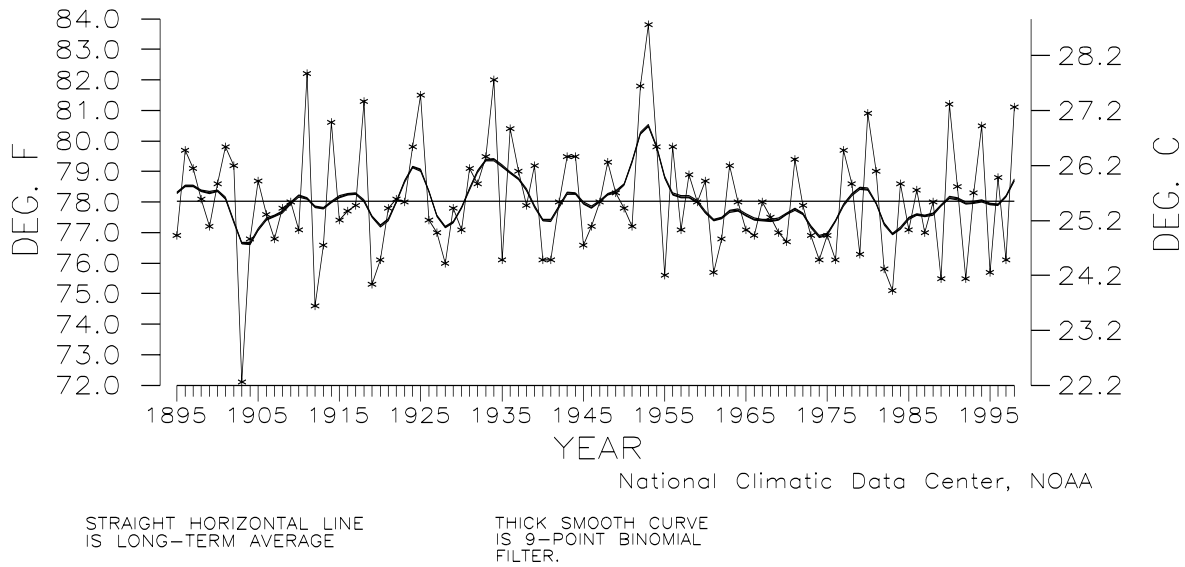


Figure 15: Preliminary data ranked June 1998 as the seventh warmest such month on record for the South Region. The South Region includes Arkansas, Kansas, Louisiana, Mississippi, Oklahoma, and Texas.

WEST-NORTH CENTRAL REGION TEMPERATURE JUNE, 1895–1998

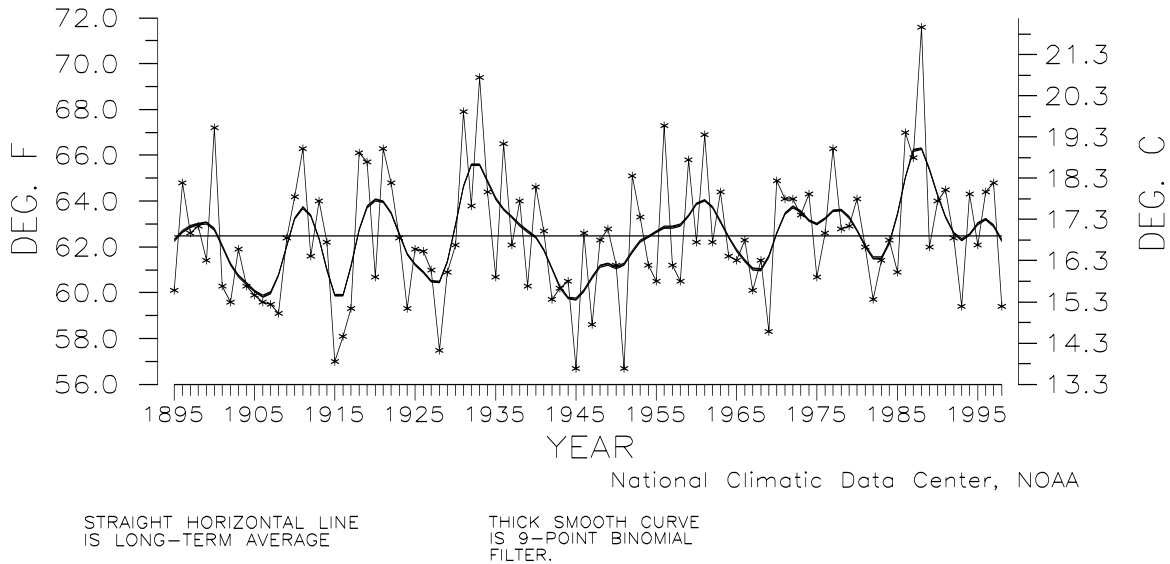


Figure 16: Preliminary data ranked June 1998 as the eleventh coolest such month on record for the West-North Central Region. The West-North Central Region includes Montana, Nebraska, North Dakota, South Dakota, and Wyoming.

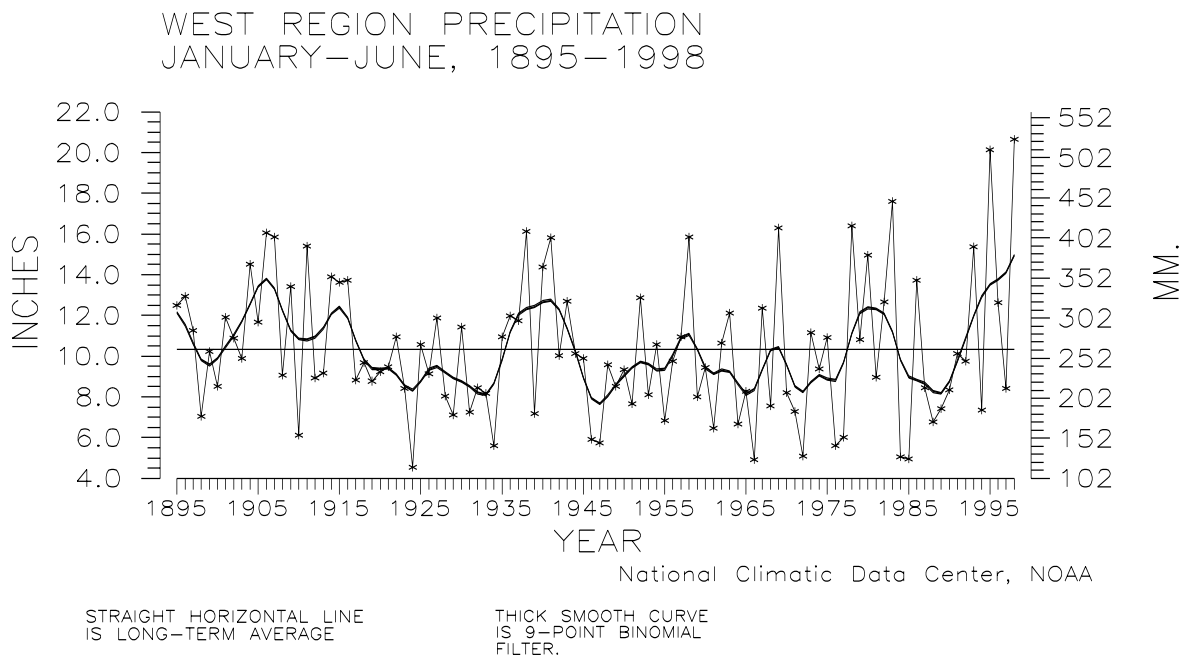


Figure 17: Preliminary data ranked January-June 1998 as the wettest such period since 1895 for the West Region. The West Region includes California and Nevada.

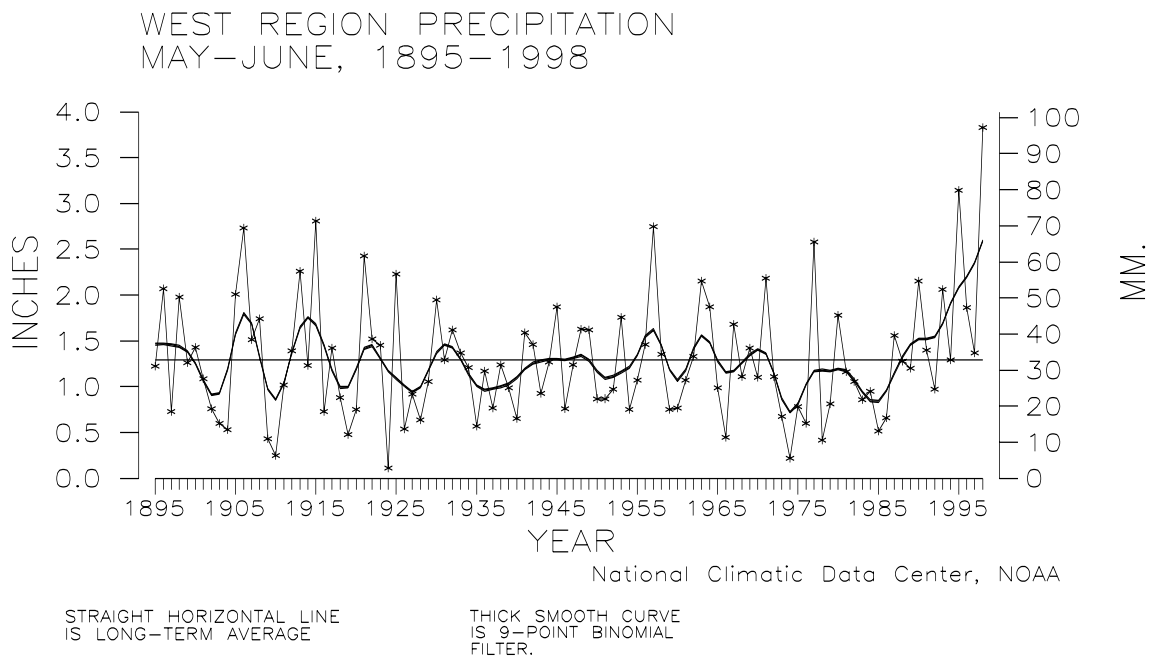


Figure 18: Preliminary data ranked the two-month period, May-June 1998 as the wettest such period on record.

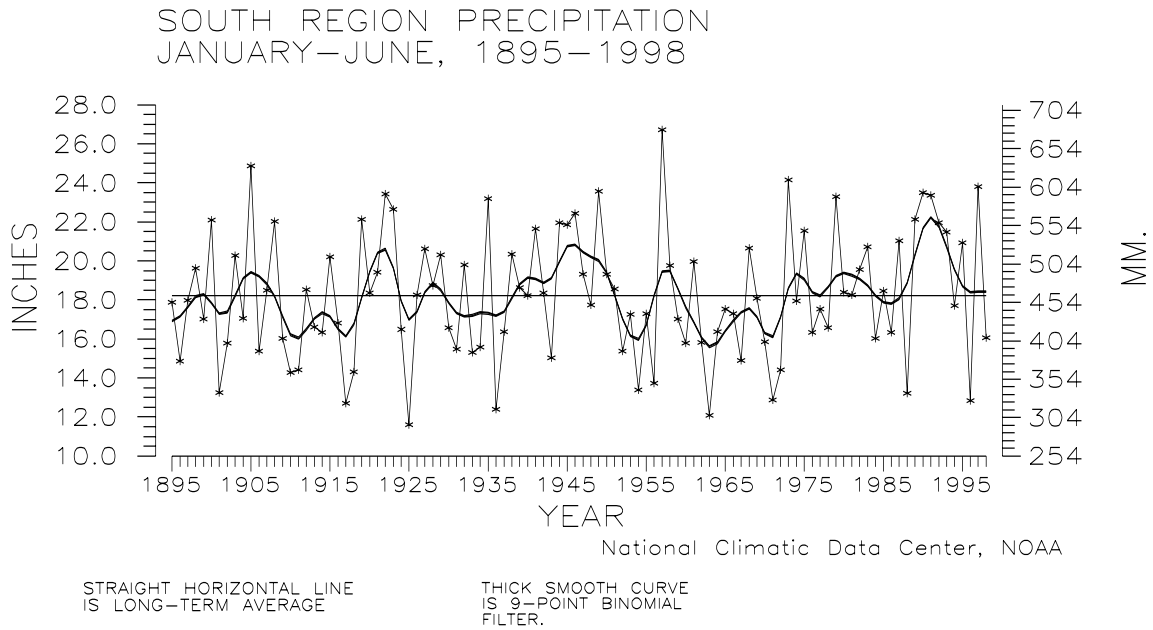


Figure 19: Preliminary data ranked January-June 1998, as the 29th driest such period on record for the South Region.

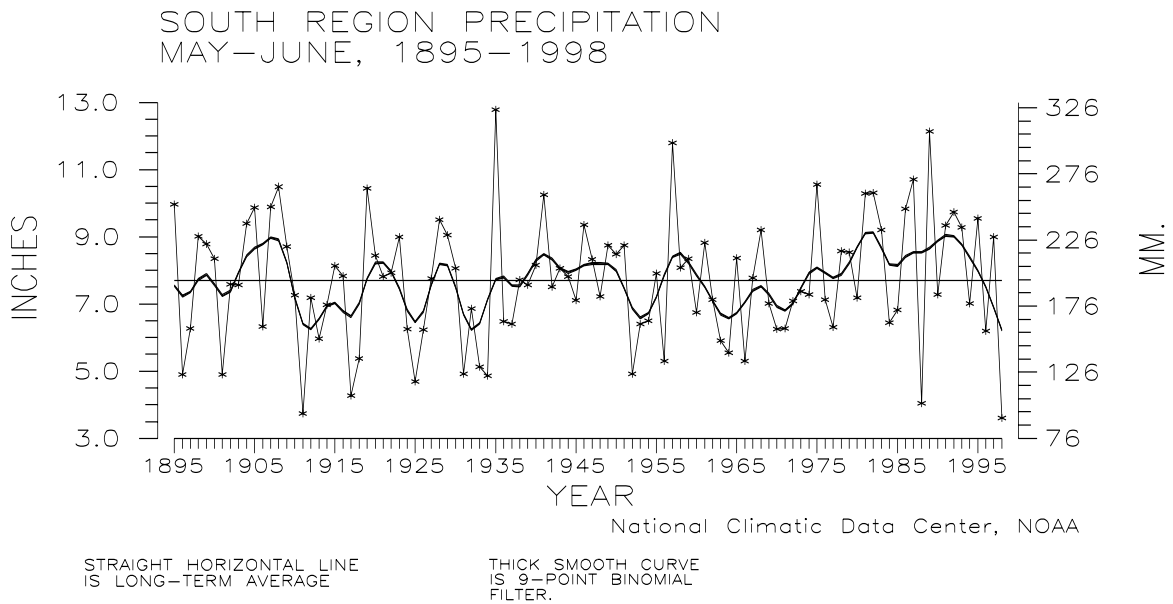


Figure 20: Preliminary data ranked the two-month period, May-June 1998, as the driest such period since 1895 for the South Region. Moderate drought conditions, especially in Texas, have become more prevalent during this time. The two-month period was also the warmest such period since 1895 (Figure 24).

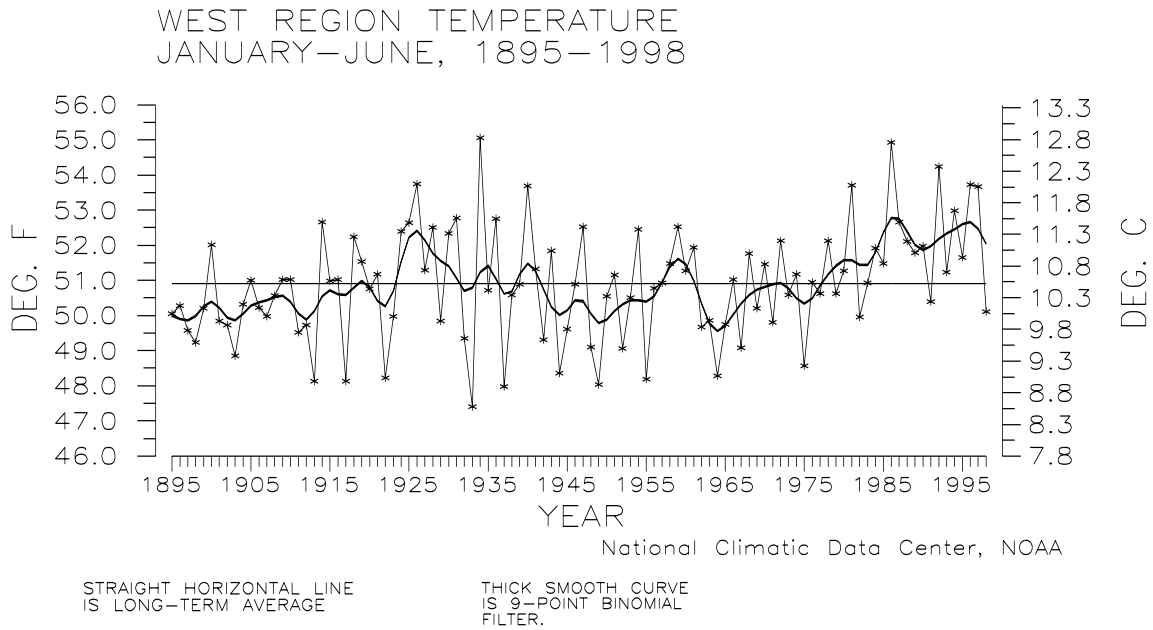


Figure 21: Preliminary data ranked January-June 1998 as the 33rd coolest such period on record for the West Region. Thirteen of the last fifteen such periods have ranked above- to much-above the long-term mean.

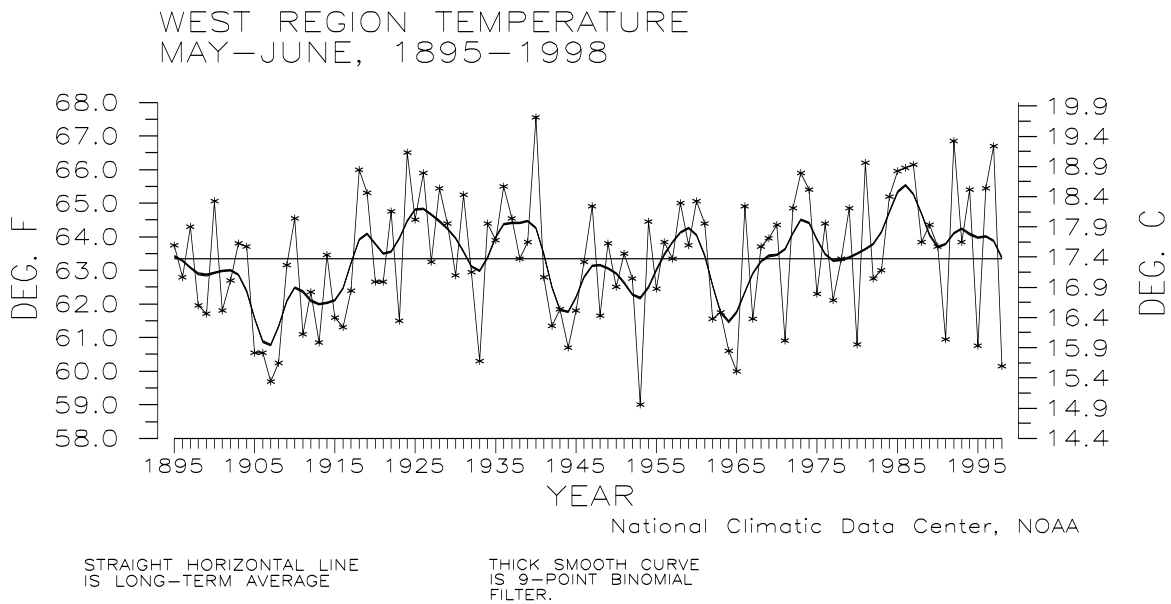


Figure 22: Preliminary data ranked the two-month period, May-June 1998, as the fourth coolest such period since 1895 for the West Region.

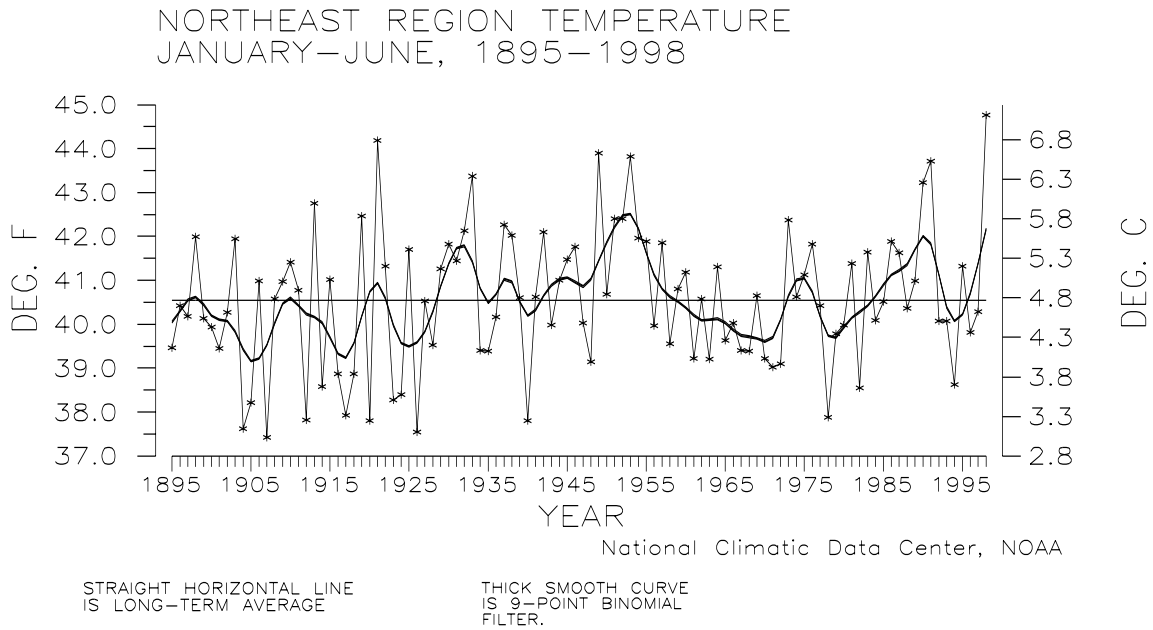


Figure 23: Preliminary data ranked January-June 1998 as the warmest such period on record for the Northeast Region. The Northeast Region includes Maryland and Pennsylvania and all states north and east.

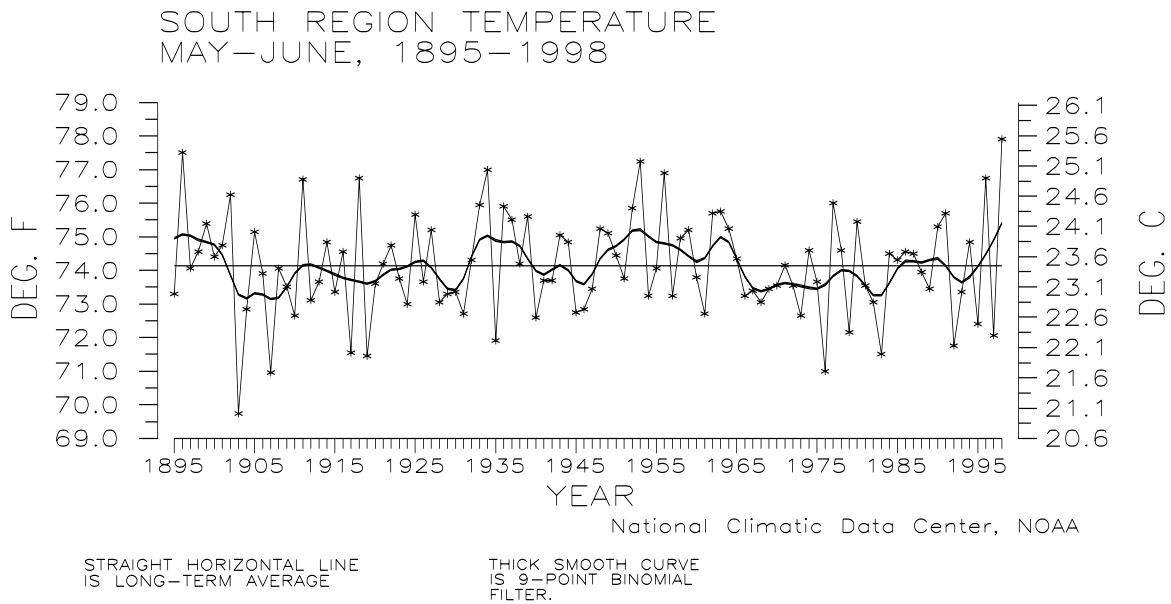


Figure 24: Preliminary data ranked the two-month period, May-June 1998, as the warmest such period since 1895 for the South Region. The two-month period was also the driest such period on record (Figure 20). This has resulted in moderate drought conditions in this region.